Total Pages: 2

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: CH208

Course Name: CHEMISTRY FOR PROCESS ENGINEERING II (CH)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions. Each carries 15 marks.

1	a)	Write a note on acid-base potentiometric titration.	(5)
	b)	What is DME? What are the advantages and disadvantages of DME?	(3)
	c)	Explain the principle and working of X-ray photoelectron spectroscopy.	(7)
2	a)	With the help of a polarogram explain the various currents involved in Polarography.	(6)
	b)	Explain the principle and applications of electrogravimetry with suitable examples.	(4)
	c)	Draw a schematic diagram of atomic absorption spectrometer. Describe the function of each components.	(5)
3	a)	Describe three different applications of coulometric titration.	(5)
	b)	Explain the principle, instrumentation and applications of mass spectroscopy with diagram.	(10)

PART B

Answer any two questions. Each carries 15 marks.

4	a)	What is critical solution temperature? Explain the phenol-water system and nicotine-water system with diagrams.	(8)
	b)	Derive the equations for the EMF of concentration cell without transference.	(4)
	c)	Define transport number of an ion. How it is related to the molar conductance?	(3)
5	a)	State and explain Kohlrausch's law. How this law is useful to determine the molar conductance of a weak electrolyte?	(5)
	b)	Write a detailed account on three different applications of Nernst distribution law.	(6)
	c)	What is electrochromism? Explain the working of electrochromic devices.	(4)
6	a)	Deduce the formulae for distribution law in the case of: - i) Association of solute in one of the phases ii) Dissociation of solute in one of the phases	(8)
	b)	Explain the Hittorff's method for the determination of transport number.	(7)

PART C

Answer any two questions. Each carries 20 marks.

7	a)	What are the important hypotheses used for the derivation of Langmuir adsorption isotherm? Derive the isotherm.	(7)
	b)	Derive an expression for the disintegration constant of a radioactive element and half-life period.	(5)

	c)	Explain the term protective colloids. Give examples. Define gold number of a protective colloid.	(4)
	d)	Give the classification of surfactants.	(4)
8	a)	Explain the following i) Transient and secular equilibrium ii) Nuclear reaction cross section iii) Liquid drop model of nucleus	(9)
	b)	With the help of BET equation, how can we determine the surface area?	(5)
	c)	Describe the principle and applications of neutron activation analysis.	(6)
9	a)	Explain zeta potential, Donnan membrane potential and Dorn effect.	(10)
	b)	What are radioactive tracers? Discuss the important applications.	(5)
	c)	Define binding energy of a nucleus. Explain the stability of the nuclei with the help of binding energy curve.	(5)

****